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# **Chinese Defense Spending, 1965-79**

**A Research Paper**

*SR 80-10091  
July 1980*

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## **Chinese Defense Spending, 1965-79**

### **Overview**

Estimated Chinese defense spending over the past 15 years shows two distinctly different trends. Spending rose rapidly from 1965 to 1971—at an average rate of about 10 percent a year—then fell sharply in 1972; and since then it has grown at an average rate of only 1 to 2 percent annually. The abrupt shift was associated with a policy change that gave greater priority to general economic development.

The recent pattern of limited growth in defense spending may reflect technological constraints as well as government policy. Although China produces a wide range of weapons, they are mainly copies or adaptations of Soviet designs first developed in the 1950s. A shutdown of high-level education during 1966-76, which was associated with the Cultural Revolution, crippled the country's technological effort. As a result, China's military research and development program has so far brought only a few indigenous designs to full operational status.

In the 1980s we expect defense spending to continue the slow-growth trend of the 1970s. China will continue to modernize its military forces, but economic and technological weaknesses will restrict the pace. The present leaders recognize that they cannot begin an extensive upgrading of defense capabilities until the economy is stronger.

Even if China's military modernization received broad foreign support during the 1980s, that support would have little impact until late in the decade. The national military-industrial base and the military forces would need time to assimilate new foreign technology.

General economic development will enhance China's ability to achieve its long-term defense goals, but the process will be slow. Defense modernization will be spread over decades rather than years because of the competing demands on the nation's limited resources.

These conclusions are based on cost estimates derived by a building-block method similar to the one used by the Central Intelligence Agency for costing Soviet defense activities. This approach is necessary because the Chinese publish almost no information on their defense spending.

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## Chinese Defense Spending, 1965-79

### Introduction

The building-block approach used in this paper consists of identifying the various Chinese defense activities in as much detail as possible, estimating the cost of each, and summing these individual cost estimates for each year.<sup>1</sup> The activities covered are those which in the United States would be defined as national security programs.

Our estimates differ markedly from those reported by the Chinese. In June 1979 they published in their state budget an entry for defense of 16.8 billion yuan for 1978 and 20.2 billion yuan planned for 1979. Our analytical constructs suggest, however, that the components of the Chinese defense effort, as defined in US terms, add up to about twice the published amount—that is, to about 40 billion yuan for 1979.

The Chinese did not explain what activities were covered by the reported figures—the first released since 1959—but they clearly represent only a part of the total. This would be analogous to the single-figure defense entry in the Soviet state budget, which also reflects only a portion of estimated total defense spending.

The “direct-costing” methodology makes it possible to analyze expenditure patterns in a variety of different ways. For example, analysis of expenditures by resource category provides a measure of Chinese force expansion and modernization, whereas analysis by the individual force components can give an insight into Chinese defense priorities.

These individual cost estimates have a margin of error, however, which could be substantial for some categories. We have greater confidence in our estimates of spending trends than in those for absolute levels, and for any given year we have more confidence in the higher levels of aggregation than in the lower ones.

<sup>1</sup> For a brief description of this analytical approach, see appendix.

We have the greatest confidence in our weapons procurement estimates, which account for about 40 percent of total Chinese expenditures for the period. We have less information about facility construction, personnel, and operations and maintenance and therefore have less confidence in our estimates for these activities—which together account for close to 45 percent of our total estimate. Military research, development, testing, and evaluation (RDT&E) account for the remaining 15 percent. Because of our many uncertainties about Chinese military RDT&E programs and their costs, we have the least confidence in this part of our estimate.

### Background

China is a large, slowly developing country, with at least three-quarters of its labor force engaged in agriculture and with a low level of output per capita in industry. Nevertheless, it maintains the world's largest Army<sup>2</sup> and manages to produce a wide range of weapon systems. The production technology used, however, and the military equipment produced are less advanced than those in industrially developed countries. The weapons are primarily copies or modifications of Soviet designs of the 1950s.

The People's Liberation Army (PLA) emphasizes large conventionally equipped ground forces. The troops have a wide range of time-tested weapons such as tanks and tube artillery, but they have few modern weapons such as antitank guided missiles or short-range tactical rockets. The air forces consist largely of air defense fighters capable of making intercepts only in good weather during daylight hours, and the naval forces are equipped primarily for coastal defense.

<sup>2</sup> China has 4.3 million men assigned to combat and combat support units and probably another 3 or 4 million uniformed personnel in administrative and service support units. As large as these forces are, they are less than 1 percent of the population, now estimated at one billion.

China also has a small number of nuclear weapons and delivery systems—bomber aircraft, medium-range ballistic missiles (MRBMs), and intermediate-range ballistic missiles (IRBMs)—that can cover most targets in the Far East. It has only a few intercontinental ballistic missiles (ICBMs); these can reach the western USSR, but none currently operational can reach the continental United States. The development and manufacture of strategic nuclear weapon systems and reconnaissance satellites attest to China's desire to pursue military programs similar to those of a modern military-industrial power.

Defense currently absorbs 5 to 10 percent of China's estimated GNP. It is in competition for economic resources, however, with the rest of the "four modernizations" areas, especially for the high-technology machinery and skilled managerial and technical manpower which are already in short supply.<sup>3</sup> This competition will become more intense as China continues to implement its "four modernizations" campaign.

Most of China's defense industrial base was developed during the late 1950s. It was developed largely with Soviet assistance and was seriously damaged by the withdrawal of that assistance in 1960. After a period of recovery (1961-65), China began a broadly based program to expand and disperse its defense industries. Several hundred factories have been built since 1965, about tripling Chinese defense plant capacity. Much of this capacity, however, uses antiquated production processes, and for unknown reasons much of it appears to be idle. Imports of special high-quality raw materials, machinery, and precision instruments from Japan and the West continue to play an important role in China's production of its more advanced military equipment.

### **Expenditure Trends**

The pattern of Chinese defense spending shows considerable variation (see figure 1). Arms production virtually stopped in the early 1960s, as the effects of the Great Leap Forward (1958) compounded the decline following the cutoff of Soviet economic and military assistance. By the middle of the decade, however, the output of nearly all types of weapons had

recovered. This recovery may have been stimulated by US involvement in neighboring Vietnam.

In 1966 Mao Zedong launched the Great Proletarian Cultural Revolution. Although the central authorities tried to protect defense industries from the general disruption, the personnel purges at the local level and the political activities in factories and transportation centers took their toll. During 1967, the first full year of the Cultural Revolution, the value of output of new military equipment fell by about 20 percent.

The worst effects of the Cultural Revolution on the weapons industries had passed by late 1968. Heightened tensions with the Soviet Union then began to spur defense expenditures, which rose rapidly to a peak in 1971. Growth in annual defense expenditures for the period 1965-71 averaged 10 percent.

In 1972 defense procurement was again cut severely. A decline of about 70 percent in aircraft procurement was responsible for most of the drop; production of naval ships and land arms declined also, but its impact on total spending was less. Defense spending as a whole dropped 20 percent. Three factors apparently were responsible: a new emphasis on agriculture; reduced military influence in policymaking as the shattered Party and government apparatus recovered from the Cultural Revolution and the fall of Lin Biao;<sup>4</sup> and a realization by the military that continued large-scale output of older weapons was at the expense of its long-term efforts at defense modernization.

Overall defense spending increased 1 or 2 percent per year between 1972 and 1978, but expenditures in 1978 were still below the 1971 peak.

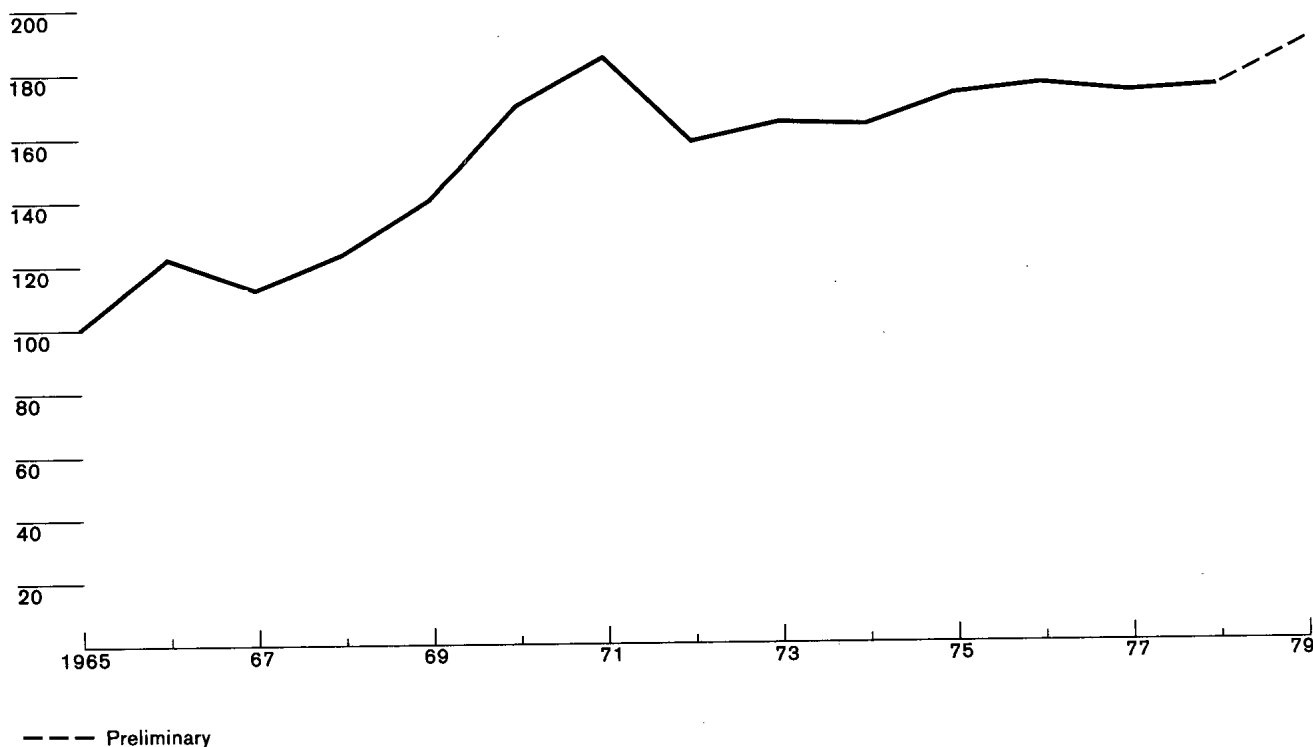
In February and March 1979 (after an extended period of mobilization and force buildup beginning in late 1978) the Chinese engaged Vietnam in a month of intense fighting. We can estimate only generally the direct costs of that war, but we judge that their addition to ongoing defense expenditures caused a sharp increase in the total for 1979, a total which probably exceeds the calculated 1971 peak.

<sup>3</sup> The "four modernizations" (agriculture, industry, defense, and science and technology) aim at achieving developed-nation economic status for China by the year 2000.

<sup>4</sup> Before his fall in late 1971, Lin Biao was Defense Minister and Mao's constitutionally designated successor. The growth in defense spending between 1965 and 1971 coincided with his rise in power.

**Figure 1**  
**China:**  
**Estimated Defense Expenditures**

Index: 1965=100



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#### **Spending by Resource Category**

Chinese defense expenditures may be separated into three resource categories—investment, operating, and RDT&E. Investment expenditures reflect the flow of new or replacement equipment and facilities to the forces; operating expenditures are the costs associated with their day-to-day functioning; and RDT&E expenditures support activities concerned with future force modernization.

About 50 percent of the estimated spending over the 1965-79 period went for investment in equipment (roughly 40 percent) and facilities (roughly 10 percent). Operating costs absorbed about 35 percent of the total and RDT&E an average of about 15 percent (see figure 2).

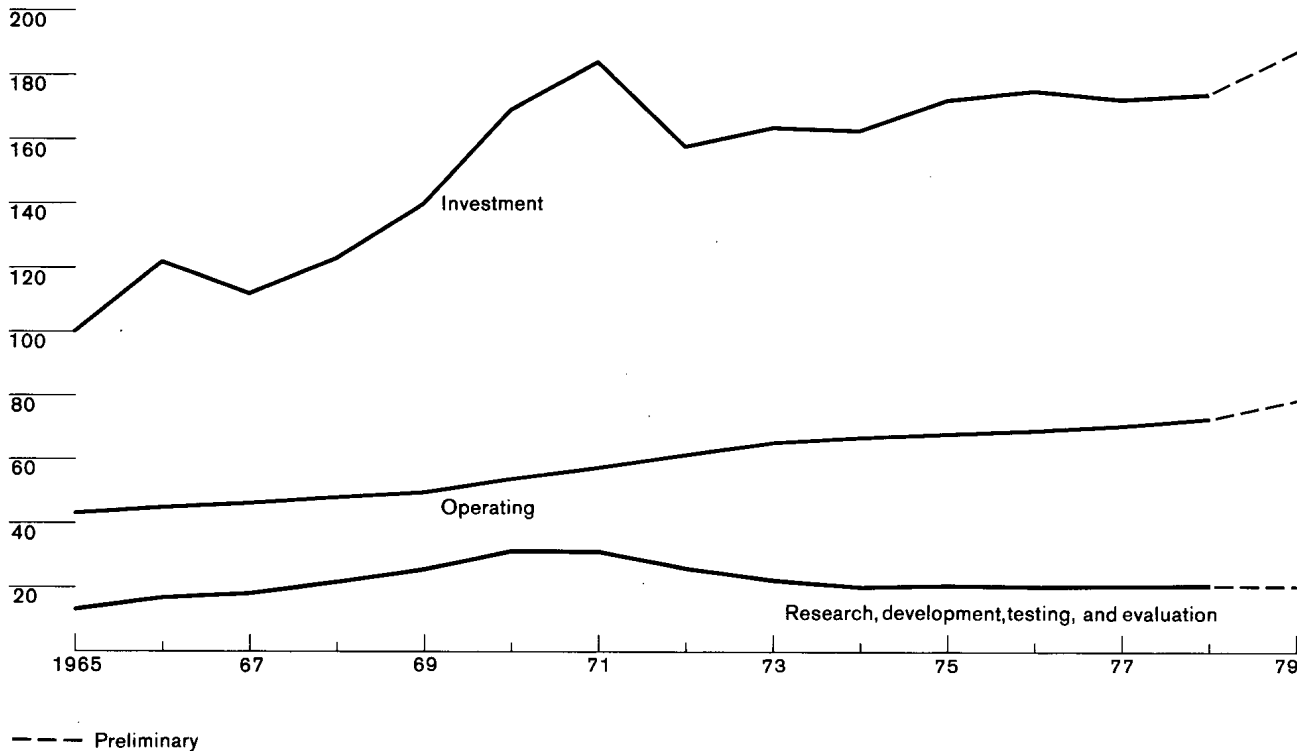
**Investment Expenditures.** Defense investment consists of both the procurement of weapons and equipment and the construction of military facilities. About 80 percent of investment spending has been for weapons procurement, with about one-half of this allocated for aircraft, missiles, and ships.

The Chinese continue to procure large quantities of equipment that was first produced in China during the mid-1960s or earlier—items that were designed in the USSR in the 1950s. The weapons which the Chinese began to produce in the 1970s are still being procured in only small numbers. This pattern may reflect limited capabilities to mass-produce the more technologically advanced hardware.



**Figure 2**  
**China:**  
**Defense Spending by Resource Category**

Index: 1965 total=100



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**Procurement** is the category that largely determines the total Chinese expenditure trend. In addition to its sheer volume—40 percent of total outlays—spending for procurement of new equipment is the most volatile element of defense spending and the one most susceptible to policy change. For example, the sharp drop in total spending in 1972 resulted mainly from the slash in the production of military equipment.

**Operating Expenditures.** We estimate that operating expenditures between 1965 and 1979 grew at an average annual rate of slightly less than 5 percent. Operating expenditures include personnel costs and the cost of the operation and maintenance (O&M) of

equipment and military facilities. Within this category, O&M costs have grown somewhat faster than personnel-related costs—primarily reflecting a slow increase in the weapons inventory.

**RDT&E Expenditures.** The Chinese have limited their RDT&E efforts to a few major projects. These have generally included one or two models in each major type of weapon system (such as aircraft, missiles, and ships). The systems being developed show a substantial technological improvement over those currently being produced, but they still only represent weapons technology of the early 1960s.

Progress in general has been slow, and many projects that were begun in the late 1960s are still under development. This difficulty in translating research into production may reflect limitations caused by the scarcity of trained scientific personnel and the underdeveloped condition of China's technological base.

#### **Spending for the Forces**

Another way of analyzing our estimated cost data is by use. For the purposes of this paper, we have divided Chinese defense spending into six functional components. Five are related to different types of combat forces: ground, naval, air defense, air attack, and ballistic missile. The sixth functional component includes activities—such as command and support and RDT&E—that provide common services to all the others.

**Ground Forces.** With a population of 1 billion, China maintains an army that is huge in comparison with the armies of other countries. The costs of this force are small relative to its size because the Chinese troops are paid low wages and are lightly equipped. Spending for the ground forces has gradually increased, however, and since 1965 has averaged over 20 percent of total defense spending.

**Naval Forces.** Estimated spending for China's naval programs (which include a small land-based force of naval aircraft used for fleet defense and maritime reconnaissance) more than doubled between 1965 and 1972, primarily reflecting growth in the procurement of ships and boats. Since that time, the level of spending has been relatively constant, as a recent slowdown in the construction of submarines and small combatants has been offset by increased production of destroyers and frigates. Naval expenditures accounted for roughly 20 percent of military spending during the 1965-79 period.

**Air Defense Forces.** The overall level and trend of spending for air defense forces has been determined primarily by the rate at which Beijing has produced new aircraft and surface-to-air missiles. Spending for this component increased rapidly between 1965 and 1971, decreased sharply in 1972, and then increased gradually through 1978. Air defense expenditures represent nearly 20 percent of China's total defense spending for the 1965-79 period.

**Air Attack Forces.** The spending pattern for air attack forces reflects the uneven nature of Chinese aircraft production. Expenditures rose steeply during 1965-71 but began a decline in 1972. The trend continued slightly downward through 1974 and then followed a fluctuating pattern through 1979. Somewhat less than 5 percent of cumulative defense spending for 1965-79 has gone to these forces.

**Ballistic Missile Forces.** The investment and operating costs for China's ballistic missile force (about 100 MRBM and IRBM launchers and a few ICBM launchers) have amounted to less than 5 percent of cumulative defense spending since 1965. We do not include in this figure the considerable expenditures associated with ballistic missile RDT&E, which account for about two-thirds of our total estimate for Chinese RDT&E.

**National Command and Support Activities.** About 30 percent of Beijing's total defense expenditure was accounted for by the remaining activities, which include RDT&E and command and support components. Command and support components include a variety of general rear-service functions such as logistics, security, intelligence, medical services, and administration.

#### **Relation of Defense Spending to National Income**

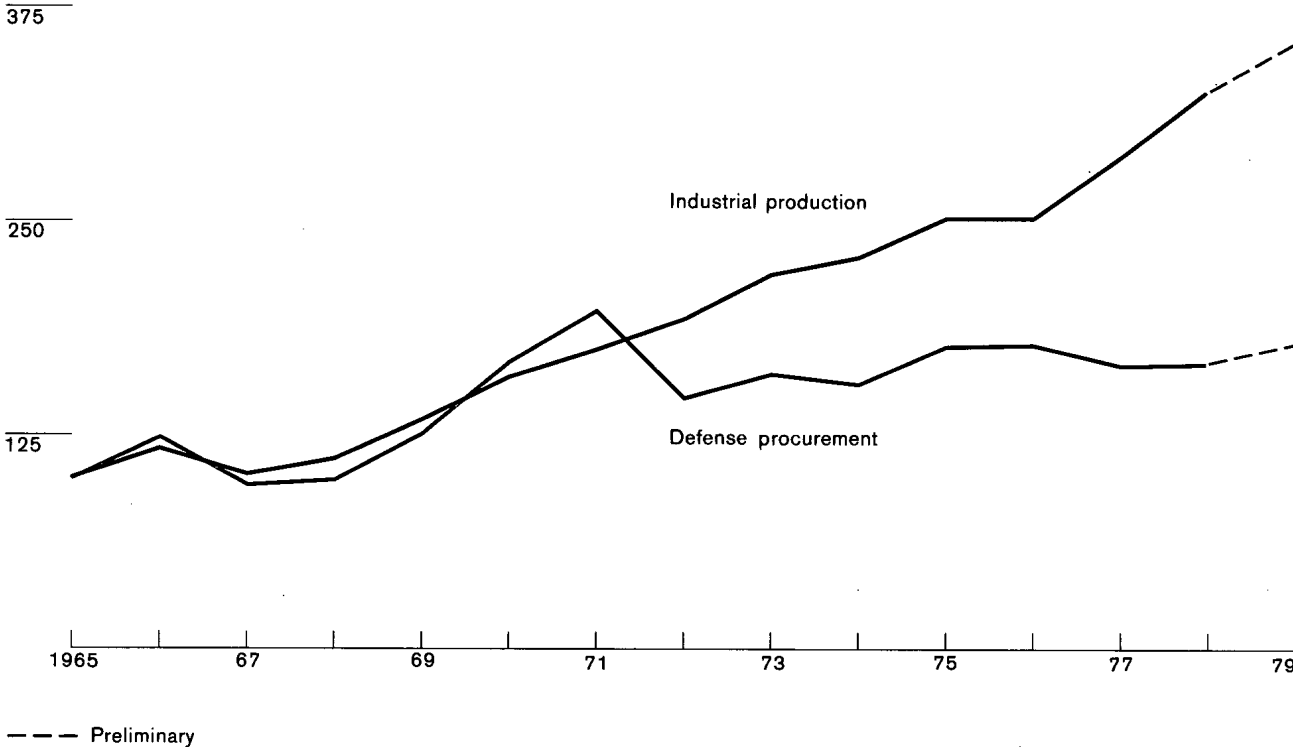
We estimate that military spending in China is taking a much smaller share of China's gross national product during 1970-80 than it did in 1965-71. GNP is now 60 percent above the 1971 level and industrial production is 100 percent above, but military spending is only now reaching the 1971 level. Figure 3 shows how general industrial production has outstripped defense procurement. A comparison of their respective trends shows that defense procurement growth conformed closely to the growth of industrial output through 1971. Since 1972, however, industrial output has continued its upward trend while defense procurement has increased only slightly.

#### **Outlook**

China will continue to modernize its military forces, but at the conservative pace that has characterized expenditure trends since 1972. The current leaders, now more than ever, recognize that they must correct

**Figure 3**  
**China:**  
**Defense Procurement and Industrial Production**

Index: 1965 = 100



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the fundamental weaknesses in the economy before they can undertake an extensive upgrading of defense capabilities.

The forces are unlikely to receive large numbers of new weapon systems. Although China's military RDT&E effort began in the 1960s, few new weapon systems were ready for large-scale deployment in the 1970s. This movement from research to production is unlikely to speed up until the Chinese overcome the limitations imposed by the weakness of their technological base. China has only a limited number of scientists, most of whom were trained abroad in the 1940s and 1950s. They are aging now, but because of the hiatus in higher education during 1966-76, the country has not trained enough scientists to replace them. The universities are

only now beginning to reestablish their science curriculums, and in the meantime, large numbers of scientific personnel are being sent to the United States, Western Europe, and Japan to update their scientific knowledge.

For several years the Chinese have been surveying the technology and equipment of Western arms producers. They have expressed an interest in such defensive weapons as antitank and anti-aircraft missiles, but they also appear to be interested in aircraft and electronic equipment. They have imported from the West some equipment and technology that could be modified for weapons purposes, but they have imported few, if any,

complete weapon systems. The Chinese apparently would rather purchase the complete technology of a particular weapon system, including the manufacturing process, than large quantities of hardware.

Even if China were to acquire foreign defense-related equipment or technology, the impact on force capabilities would not become apparent until the late 1980s. Time is needed to assimilate new technology into the existing production processes, to develop associated maintenance and logistic structures, and to train military personnel in the use of the equipment. The Chinese might participate in joint ventures or coproduction programs with other nations, but assimilation would still take time.

Thus, the Chinese defense effort probably will be largely a continuation of the trend before the invasion of Vietnam. The major constraints on more rapid defense modernization are economic and technological. Under the current, more pragmatic leadership, China is likely to make progress in these areas, and in the long run this progress will benefit the military. But unless Beijing receives large-scale foreign assistance—which is unlikely—its limited resources and the competing demands throughout the economy will restrict it to gradual advances in military technology and defense modernization.

## **Appendix**

### **Costing Methodology**

Our estimates of Chinese defense spending are based on a building-block methodology similar to that which has been developed over many years to assess the defense costs of the Soviet Union. We compile a detailed list of the activities and physical components of the defense program for each year. This list includes data on order of battle, manpower, production of equipment, construction of facilities, and the operating practices of the military forces.

These force components and activities are then converted into monetary estimates. For some components we have yuan prices, and these components are costed directly in yuan. For each of the remaining components, we estimate what it would cost if produced in the United States and then convert these dollar costs to yuan using suitable yuan-dollar ratios.

We use several conversion ratios, which are constructed to reflect the relative differences in the US and Chinese price structures. They are based on an extensive sample of prices for comparable US and Chinese industrial products. For example, the price of a particular Chinese diesel engine or tractor is compared to the price of its closest US counterpart, and the dollar price is adjusted for obvious differences in quality and design. Using the yuan-dollar ratios derived from our samples, we then construct another set of ratios for converting the dollar cost of military activities into yuan. The ratios range from 8.5 to 0.6 yuan per dollar; the ratio at the high end of the range is applied to some electronic equipment, and that at the low end to transportation services.